Efficient and effective precepting of pharmacy students in acute and ambulatory care rotations: A Delphi expert panel study

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Purpose. Using the Delphi process, a panel of experienced preceptors achieved consensus on best practices to increase preceptor efficiency and effectiveness.

Methods. The Delphi panelists completed 3 survey rounds and a face-to-face meeting. Survey questions covered several topics, including preparation of students for rotations, preceptor efficiency and effectiveness, potential resident contributions to precepting, methods of developing critical-thinking skills and providing assessment and feedback, precepting time metrics, and barriers to preceptor effectiveness. Panel consensus was defined as agreement of ≥80%.

Results. Fifteen of 36 invited preceptors (42%) completed all 3 survey rounds. The expert panel reached consensus on 6 essentials for effective rotations, 8 precepting contributions that could be made by appropriately trained residents, precepting barriers, 4 strategies for teaching critical thinking, and 5 valuable characteristics of the One Minute Preceptor model. Panelists reported on time spent with students presenting new patient cases (median, 10 minutes per case), time devoted to assessment of students’ clinical performance (median, 22 minutes per student weekly), and time dedicated to student professional development (median, 20 minutes per student weekly).

Conclusion. Important strategies for preceptors identified by the panel included (1) a thorough orientation to logistics, expectations, and scheduling of activities, (2) using appropriately trained residents in student training, (3) providing opportunities for critical thinking and therapeutic decision-making, (4) giving frequent, quality feedback on clinical activities, and (5) giving feedback to learners on a regular basis.

Keywords: Delphi process, layered learning practice model, One Minute Preceptor, pharmacy preceptor, resident training

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Expectations for pharmacy preceptors, as set forth by various professional organizations, are exceptionally high. The 2016 standards of the Accreditation Council for Pharmacy Education (ACPE) require that good role model preceptors “demonstrate creative thinking that fosters an innovative, entrepreneurial approach to problem solving, have an aptitude for facilitating learning, and the desire to educate others (patients, caregivers, other healthcare professionals, students, residents).” Additionally, the American Association of Colleges of Pharmacy expects faculty members serving as preceptors to contribute to the advancement of the pharmacy profession: “Colleges/Schools of pharmacy must provide a leadership role in supporting the growth and development of patient-centered, col-
loborative models of care delivery.” Likewise, American Society of Health-System Pharmacists (ASHP) residency accreditation standards mandate that resident training—primarily conducted by preceptors—include competencies in “teaching, education, and dissemination of knowledge.” With the growth in numbers of pharmacy students and residents nationally, recruiting and training preceptors who can meet these demands and high expectations are continuing challenges.

In the spirit of optimizing the preceptor’s role, we undertook a study using the Delphi process with an expert preceptor panel to assess tools and offer strategies to help preceptors be more time-efficient and effective, particularly in acute care and ambulatory care clinical teaching settings. The Delphi process is generally recommended when data addressing a specific issue are not available. Experienced pharmacy preceptors recognized as leaders were recruited as Delphi panelists on the premise that panelists with extensive experience as practitioners were in the best position to analyze current precepting practices and recommend improvements.

The layered learning practice model (LLPM) is a relatively new practice model featuring pharmacists, residents, and students working together to optimize patient outcomes and add value to institutions by functioning as an integrated team in clinical settings. As recently described, the LLPM was developed through a series of conferences and clinical studies aiming to advance the pharmacy profession and simultaneously address the increasing number of pharmacy students requiring training. While the resident and the student are both learners in this model, their roles are differentiated in a manner that allows all members of the team to directly contribute to patient care and optimal patient outcomes. Although the changes advocated in the LLPM further challenge pharmacy preceptors in their teaching roles, this training method has the potential to maximize current resources, including learners, and advance pharmacy practice. Therefore, we related our study findings to the implementation of the LLPM.

While the primary focus of the study was to determine optimal strategies for precepting pharmacy students, the role of residents as preceptors for pharmacy students was also considered, since pharmacy residents can potentially help preceptors be both more efficient and more effective.

We also explored other strategies that would help define best practices in precepting. Some of these include optimizing the teaching of critical thinking, identifying best strategies for providing feedback, recognizing barriers for precepting success, using technology (e.g., videos), and implementing the One Minute Preceptor (OMP) model. Briefly, the OMP model includes these steps: (1) the student provides a concise description of the patient’s issue(s) followed by a recommendation(s) for care, including supporting evidence and rationale, (2) the preceptor offers concise feedback to the student about his or her assessment of the situation, (3) the preceptor provides positive feedback to the student, and (4) the preceptor corrects any mistakes or errors in the student’s presentation. The OMP model’s positive impact on precepting efficiency and effectiveness has been demonstrated in other health professions; however, the model has not yet been advocated as a tool for preceptors in pharmacy. Therefore, we included the OMP model as a focus of our study.

The goals of the study were to achieve consensus on best practices to increase preceptor efficiency and effectiveness and to identify the most important limitations of current clinical training.

Methods

The study received exempt-status approval from the Touro University California institutional review board. An e-mail invitation was sent to 36 experienced advanced pharmacy practice experience (APPE) and resident preceptors currently practicing throughout California to participate in the Delphi process. The invitation list included representatives of all California schools and colleges of pharmacy. Preceptors were invited on the basis of years of experience (i.e., ≥10 years), active leadership in pharmacy education and training, or both.

The Delphi process used in this study followed the methodological criteria recommended by Diamond and colleagues. This process involves 2–4 rounds of surveys to which a panel of experts respond or comment with the goal of reaching consensus. For this project, we defined consensus as at least 80% agreement or disagreement. For “strongly agree,” “agree,” “disagree,” and “strongly disagree” items, consensus was defined as at least 80% “strongly agree” or “agree”
Panelists reached consensus that a student project(s) should be assigned along with its completion plan (SOAP) method for presenting SOAP note for any rotation. Panelists agreed that since giving an orientation to students on day 1 of any clinical rotation was very important, and that information should include but not be limited to institutional policies, a checklist of duties and planned activities, computer access, logistics, and a rotation schedule. Furthermore, student expectations, grading, frequency of feedback, and professional conduct should also be discussed on day 1. Panelists agreed that a student project(s) should be assigned along with its completion date during the first week of the rotation. Panelists agreed that since the subjective-objective-assessment-plan (SOAP) method for presenting patient cases is very important, there should be more preclinical training of students in how to write a professional SOAP note for any rotation.

Table 2 lists strategies for optimizing the effectiveness and efficiency of rotations that were developed during the face-to-face meeting and for which consensus was achieved. Four of these strategies related to students (i.e., preclinical training, orientation, a checklist of learning objectives, and viewing technical videos), while 2 pertaining to resident training and protected teaching time for residents.

Table 3 lists consensus items for specific responsibilities that a resident with appropriate training should be able to perform while on rotation. Panelists reached consensus that a preceptor training orientation would clarify the role of the preceptor, as well as the expectations of the school or institution, and that an institution should offer continuing-education responses or at least 80% “disagree” or “strongly disagree” responses. For “yes,” “maybe,” and “no” items, consensus was defined as at least 80% “yes” or “no” responses. We stopped the Delphi process when consensus was reached.

Using Qualtrics survey software (Qualtrics, Provo, UT), 20 survey items were developed for the round 1 online survey from themes commonly reported in the literature on precepting students on rotations.6–15 The items were field tested prior to round 1 by project team members who were preceptors. The round 1 survey was distributed electronically, with 2 reminders sent at weekly intervals; 6 weeks after the initial distribution, panelists were sent a report on the survey responses. The online survey process was repeated (round 2), after which a face-to-face meeting was convened. The face-to-face meeting agenda included issues on which consensus was not reached and new areas brought up in reviewer comments. There was no voting at the face-to-face meeting, and unresolved issues were incorporated into the round 3 survey, which was distributed online and analyzed as described above. A final report was generated in draft manuscript form and distributed. Panelists were invited to contribute to manuscript development.

Results

Fifteen of 36 invited preceptors (42%) accepted our invitation to participate in the study and made up the expert Delphi panel. Table 1 provides demographic data on the expert panel.
(CE) credit to those who complete the preceptor orientation. However, they reached consensus that payment for precepting and CE credit should not be given to preceptors for teaching students.

Panelists agreed that residents with appropriate training can be very helpful to the primary preceptor and are a valuable addition to the healthcare team. However, panelists were not in agreement that the residency program should provide a separate preceptor training rotation for residents.

Although we thought preceptors would express major concern about potential barriers to preceptors’ effectiveness (Table 4), as has been described by others in the literature, consensus that such issues pose a barrier to efficiency or effectiveness was not reached for any item assessed in the survey. In fact, regarding 3 items (lack of compensation for precepting, having students with low skill levels, and conflicting objectives of the rotation site and the educational program), overall panelists agreed that these were not major barriers.

Data on the surveyed metrics for precepting time requirements (time spent with a student presenting a new patient case, evaluating a student’s clinical performance weekly, and discussing a student’s personal and professional goals weekly) are shown in Table 5. The median time to present a new patient case was 10 minutes, longer than the expected time to present a case using the OMP model, but the range of time values reported by the small panel used for this study was quite wide.

All panelists agreed that it is difficult to teach critical thinking effectively. Table 6 lists the strategies for which consensus regarding effectiveness in teaching critical thinking was achieved. Citing example cases and giving opportunities to discuss patients critically were considered vital for improving this skill.

Panelists agreed that feedback should be given soon after observation of a student’s activities and should be conveyed in a one-on-one discussion with the student. Preceptors reported taking 20–30 minutes a week to talk about clinical performance and discuss career goals with each student. They reached consensus that formal assessment should occur both midrotation and at the end of a rotation. In addition, 2 feedback strategies that were reported to be effective were the sandwich method, which involves giving positive feedback followed by constructive negative feedback and then more positive feedback; and a process of describing a deficiency, setting a goal for improvement, and performing a follow-up reevaluation.

After viewing a video on the OMP model, panelists came to consensus on several items regarding its value, as shown in Table 7. There was also 100% agreement that the OMP model should be taught during preceptor training or to those not familiar with
Table 4. Delphi Panelists’ Views on Potential Barriers to Preceptor Effectiveness

<table>
<thead>
<tr>
<th>Potential Barrier</th>
<th>No. (%) Panelists (n = 15)</th>
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<tbody>
<tr>
<td></td>
<td>Not a Barrier or Somewhat a Barrier</td>
</tr>
<tr>
<td>Conflicts between school/college and rotation site</td>
<td>14 (93)</td>
</tr>
<tr>
<td>No compensation for additional work of precepting</td>
<td>13 (87)</td>
</tr>
<tr>
<td>Other healthcare professionals’ lack of exposure to clinical pharmacy</td>
<td>13 (87)</td>
</tr>
<tr>
<td>Low student skill levels</td>
<td>12 (80)</td>
</tr>
<tr>
<td>Productivity expectations of institution</td>
<td>7 (47)</td>
</tr>
<tr>
<td>Not having enough time to teach or precept</td>
<td>6 (40)</td>
</tr>
</tbody>
</table>

Table 5. Preceptor Time Spent With Students, as Reported by Delphi Panelists (n =15)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mean ± S.D. Time in All Settings (n = 15)</th>
<th>Ambulatory Care (n = 6)</th>
<th>Acute Care (n = 9)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presenting a new patient case (min)</td>
<td>11.4 ± 4.5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Evaluating clinical performance (min/wk)</td>
<td>27.1 ± 11.3</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>Discussing professional/personal goals (min/wk)</td>
<td>20.3 ± 10.7</td>
<td>17.5</td>
<td>30</td>
</tr>
</tbody>
</table>

*Overlap in reporting of practice sites precluded calculation of mean values for ambulatory care and acute care settings.

Table 6. Strategies for Teaching Critical Thinking: Consensus Recommendations

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Strongly Agree or Agree, no. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assign reading material and require student to report back with synopsis of findings</td>
<td>15 (100)</td>
</tr>
<tr>
<td>Give student opportunity to think “offline”; resume discussion later</td>
<td>15 (100)</td>
</tr>
<tr>
<td>Ask students to speak up when they do not understand or cannot answer so that they are not left behind</td>
<td>13 (87)</td>
</tr>
<tr>
<td>Cite examples of cases that include critical-thinking questions/exercises</td>
<td>13 (87)</td>
</tr>
</tbody>
</table>

*Consensus of Delphi panel members (n = 15).

Discussion

Orientation. The panelists agreed that efficiency is improved when an orientation is given on rotation day 1 to the entire group. Panelists suggested that, along with a discussion of the important therapeutic issues, this time can be used to get a feel for the students’ capabilities and goals for the rotation. Furthermore, it is also a good time for pointing out resource materials such as review articles, relevant books, and Internet websites that would be helpful to the student during the rotation.

Delphi process. The use of the Delphi process allowed the investigators to obtain good insight into several issues and gain consensus on precepting practices generally used for pharmacy students. In addition, it gave the panelists the opportunity to expand on their thoughts and provide an explanation for their recommendations. For example, 1 panelist commented that “students would benefit from instruction in the classroom that is tailored to what they would encounter on rotations, in real-life, or as close to real as possible.” Another panelist suggested that instructions about usual clinical encounters would be best given by experienced practitioners. In addition, some panelists commented that having a student receive didactic preclinical training in critical thinking and techniques was important for optimizing the student’s APPE.
Although we defined consensus as agreement of ≥80% among the 15 panelists, there were several items for which agreement of 50–80% was achieved, suggesting that these items had some degree of importance for the majority of the panel. For example, with regard to providing feedback to a student who does not perform a skill well, 10 of 15 panelists agreed that the preceptor should first demonstrate the skill, then have the student perform the skill, and then provide immediate follow-up on the student’s performance.

**Effectiveness and efficiency.**
Our panelists’ consensus statements about optimizing effectiveness and efficiency were congruent with existing literature on the topic. The statements overlapped with published student perceptions of preceptor excellence and concurred with other literature regarding communication between students and preceptors. Panelists confirmed that it is essential for preceptors and students to communicate with the clinical team with the patient as the focus; this is consistent with the ACPE expectations about pharmacy practice being collaborative, interprofessional, and patient centered. A preceptor’s belief that students may add value to the clinical practice is likely to encourage students to behave like peers. Results of 1 study suggested that a student may perform the duties of a peer; for example, some programs encourage students to provide education to professional colleagues and other students.

**Barriers.** We explored potential barriers to preceptor efficiency or effectiveness or both. Our survey items included barriers commonly cited in the literature, and we anticipated that panelists would identify some or all of them as actual barriers. We were surprised that the panelists did not achieve consensus that any of the potential barriers listed in the survey posed a major barrier; in fact, there was consensus (agreement of ≥80%) that 3 listed items were not barriers. Since we could find no literature regarding these 3 items, we hypothesized that expert preceptors had found ways around those potential barriers and that a less experienced preceptor might have responded differently. We also questioned whether preceptors could absorb the additional potential barriers and preceptor demands envisioned with wide use of the LLPM.

**Critical thinking.** Panelists commented that while students on rotations need to be ready as critical thinkers, most are not and must learn this skill during rotations. The 2016 ACPE accreditation standards state that students should demonstrate critical-thinking skills during their clinical experiences. The literature confirms that critical thinking is very difficult to teach because it involves the application of evidence-based medicine and clinical reasoning, which are obtained over time. The literature suggests that novices, like students starting their first practice experience, are at a disadvantage in terms of demonstrating critical-thinking skills because they have little clinical experience. We think that the strategies described in Table 6 would help enhance students’ abilities to employ clinical reasoning when making therapeutic decisions. A suggestion from the literature advises that preceptors explain their rationale for therapeutic decisions by thinking out loud, which also has the benefit of saving time when working in a busy clinical practice setting. We believe that it is imperative that schools and colleges of pharmacy stress critical thinking not only during APPEs but in preclinical coursework while realizing that this skill may not be fully developed until later rotations or a later residency. Panelists noted that students learn how to critically think by being challenged to defend their therapeutic recommendations. For example, questions such as “How did you determine that dose?” “What is your alternative plan?” and “What is the worst-case scenario?” are instructive. Another panelist comment suggested having students work through the thought process on a particular case or question that was put forth during clinical rounds. The panel recommended that frequent discussions of patient case scenarios that promote the use of evidence-based guidelines would give students more experience in building basic critical-thinking and clinical-reasoning skills.

**SOAP method versus OMP model.** The SOAP method is similar in structure to the Pharmacists’ Patient Care Process, a method recommended by the Joint Commission of Pharmacy Practitioners and now incorporated into ACPE guidelines. Panelists commented that the time needed to present a patient case tended to decrease as the student progressed through a rotation. With regard to the OMP method, panelists commented that it would be more efficient than the SOAP method for a preceptor who has a heavy schedule.

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**Table 7. Value of One Minute Preceptor Model: Consensus Statements**

<table>
<thead>
<tr>
<th>Model Characteristic</th>
<th>Strongly Agree or Agree, no. (%)</th>
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<tbody>
<tr>
<td>Provides feedback to students in more timely manner</td>
<td>15 (100)</td>
</tr>
<tr>
<td>Teaches students in more effective manner</td>
<td>15 (100)</td>
</tr>
<tr>
<td>Promotes student involvement in decision-making (student must make commitment)</td>
<td>15 (100)</td>
</tr>
<tr>
<td>Allows preceptor to spend time more efficiently</td>
<td>14 (93)</td>
</tr>
<tr>
<td>Improves students’ critical thinking (e.g., rationale for drug selection)</td>
<td>12 (87)</td>
</tr>
</tbody>
</table>

*CConsensus of Delphi panel members (n = 15).*
ing our face-to-face meeting, panelists commented that although “SOAPing” tends to be more time-consuming, it assures that the student has not missed a key area and understands the whole patient. Finally, panelists noted that the OMP model may help the preceptor evaluate students’ critical-thinking skills by requiring them to explain their rationale for therapeutic plans. However, panelists’ comments indicated that using the OMP method too early in the rotation may inadvertently mask student deficiencies.

The 10-minute median time for presenting a new patient case reported by our panelists is roughly double the 3- to 5-minute period allotted in videos depicting OMP-type processes. Although the literature indicates that the OMP model is efficient for discussing patient cases, the data in Table 7 and panelists’ comments suggest that preceptors have not figured out how to tighten patient case presentations to approach true OMP levels. We suggest that since OMP-style presentations have been successfully embraced in other health professions, pharmacy preceptors may benefit from implementing the OMP model in conjunction with other healthcare training programs.

**Feedback.** The healthcare literature contains substantial information about the evaluation process but relatively little about the “art” of feedback. Previous work suggests that feedback provides students and residents with a benchmark of their performance and helps with identification of strengths and weaknesses. Our study supports what others have recommended—that evaluation should be summative, be reflective, and take place during established times (midrotation and end-of-rotation time points), while formative feedback should be given close to the time of demonstration of a skill. The reported times spent with students (Table 5) seem reasonable and need to be factored in when deciding how many students a preceptor can effectively manage.

For poorly performing students, critical feedback should be given in a one-on-one setting. If the student’s clinical performance, attitude, or professionalism is having a negative impact on patients and the team dynamically, the issues should be discussed immediately in private, with removal of the student from the rotation if necessary.

Regarding feedback to residents, ASHP accreditation guidelines for pharmacy residency training programs emphasize the importance of feedback. However, results of a survey revealed that the evaluation process was one of the most overwhelming duties that preceptors perform. While preceptors believed they provided adequate evaluation, residents believed the frequency and quality of preceptor feedback were insufficient. Although that study involved only residents, we propose that both residents and students would benefit from preceptors receiving training on giving good feedback.

**Preceptor training.** Affirming the need for more preceptor training, Assemi and colleagues reported that 73% of surveyed preceptors desired more formalized training in feedback and evaluation. Panelists supported the concept of preceptor training for all preceptors and agreed that preceptors-in-training should receive CE credit. We suggest that the 8 areas shown in Table 3 could serve as a curricular guide for a preceptor training program. These same activities are important requirements for being an effective primary preceptor. With regard to the role of pharmacy residents as preceptors, panelists emphasized the need for appropriate training, which is congruent with the LLPM. For residents to be effective as preceptors, 1 panelist suggested, residents should be given an orientation to the specific rotation 1 week prior to the start of a student’s rotation. Panelists commented that residents can free up preceptors’ time by helping with didactic teaching and some service activities. For example, in the acute care setting, when the workload precludes the preceptor from rounding with the team, residents can play a major role in overseeing students on clinical rounds. Furthermore, a resident who has trained extensively in an ambulatory care clinic may be helpful to the primary preceptor by handling clinic workflow and clinical activities. It was noted, however, that it takes training and several months before most residents can take on these responsibilities.

Due to training requirements, scheduling remains a significant problem for the pharmacy preceptor who can only count on resident support for part of the calendar year. As organizations increase the number of postgraduate year 1 and postgraduate year 2 residency positions, this problem should lessen, making LLPM implementation easier.

**Limitations.** Among other study limitations, the Delphi panel was almost wholly drawn from acute and ambulatory care settings and did not include preceptors from community pharmacy settings (although they were invited to participate); we believe the panel’s composition made reaching consensus easier but limits the generalizability of the study findings to the former 2 practice settings. Furthermore, the panelists were all currently practicing in California, possibly limiting their practice perspectives. However, we found that several panelists had graduated from pharmacy school, completed residencies, and/or practiced previously in other states. The panelists averaged over 20 years of experience both in practice and in precepting. While this length of service implies a considerable wisdom in our preceptor panel, it is possible that newer and younger preceptors, whom we did not survey, might use technology and other strategies to achieve greater efficiency and effectiveness.

**Recommendations.** Based on our findings, we recommend the following to optimize preceptor effectiveness and efficiency at this critical point in the evolution of pharmacy
practice. First, schools and colleges should increase the time spent on preclinical critical-thinking activities and link them to patient-specific outcomes so that students are more prepared when they start rotations. Second, the consensus statements developed in this study should be considered when structuring or validating a practice site, rotation activities, and the scheduling of rotations. Third, preceptors and managers should commit to promoting and expanding residency positions in order to provide more and better support for preceptors and to progress toward an integrated training model such as the LLPM. Fourth, resident and student training should be structured with the LLPM in mind. Lastly, new approaches to efficiency and effectiveness such as the OMP model should be widely disseminated and implemented, with the outcomes of different strategies shared with other preceptors.

**Conclusion**

Important strategies for preceptors identified by the panel included (1) a thorough orientation to logistics, expectations, and scheduling of activities, (2) using appropriately trained residents in student training, (3) providing opportunities for critical thinking and therapeutic decision-making, (4) giving frequent, quality feedback on clinical activities, and (5) giving feedback to learners on a regular basis.

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**Disclosures**

The authors have declared no potential conflicts of interest.

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